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ON A COLLECTION OF MAMMALS FROM ECUADOR.

BY WITMER STONE.

Mr. Samuel N. Rhoads made a collecting trip to Ecuador, February–July, 1911, and secured a valuable series of vertebrates. His entire collection was purchased by the Academy of Natural Sciences of Philadelphia, and reports on the fishes and reptiles have already appeared in the PROCEEDINGS.¹ The mammals, comprising sixty-eight specimens, referable to nineteen species, were obtained for the most part on the paramo and the region immediately below, on Mt. Pichincha, 10,000–13,000 feet, while a few additional specimens were obtained from the mountains above Chambo, from the Pagma forest near Chunchi, 7,000 feet, and from Bucay, province of Guayas, 975 feet.

As the Academy previously possessed no mammals whatever from the Andes, the satisfactory identification of much of Mr. Rhoads' material was rendered impossible until such specimens could be secured for comparison. Upon his return from Peru, Mr. Wilfred H. Osgood, being anxious to make comparisons with certain Ecuador species, generously offered to compare Mr. Rhoads' specimens with the series in the Field Museum in return for their use in the identification of his Peruvian mammals. This he has done and has given me his opinion as to their relationships.

The American Museum has, through Dr. J. A. Allen, curator of mammals, loaned me specimens of *Blarina thomasi* and *B. squamipes* for purposes of comparison and the U. S. National Museum a series of *Sciurus hoffmanni*.

For this aid I would extend my sincere thanks especially to Mr. Osgood, without whose co-operation this paper could not have been prepared.

Mr. Rhoads has kindly furnished me with some field notes on *Cænolestes* and other interesting species which are duly credited.

1. *Ichthyomys söderstromi* de Winton.

Ichthyomys söderströmi de Winton, Proc. Zool. Soc. London, 1896, p. 507.

Two specimens of this interesting fish-eating rodent were obtained from Mr. Söderström, of Quito, who collected the type specimen on

¹ 1911, p. 493; 1913, p. 153.

the Rio Machangara, Ecuador, February, 1895. One of the specimens before me was obtained March 16, 1904, but neither has an exact locality.

2. *Epimys rattus* (Linn).

Mus rattus Linnæus, Syst. Nat., ed. 10, vol. 1, p. 61, 1758. (Sweden.)

One skin and three skulls in the collection, obtained at Hacienda Jalancay, Chunchi, Chimbo, and at Bucay, Guayas.

3. *Epimys norvegicus* (Erxleben).

Mus norvegicus Erxleben, Syst. Regni Anim., vol. 1, p. 381, 1777. (Norway.)

One skull, from specimen caught in a house at Bucay, June 15, 1911.

4. *Mus musculus* (Linn).

Mus musculus Linnæus, Syst. Nat., ed. 10, vol. 1, p. 62, 1758. (Sweden.)

Five specimens obtained at Riobamba and Hacienda Garzon at the southern foot of Mt. Pichincha, 11,000 feet.

5. *Oryzomys minutus* (Tomes).

Hesperomys minutus Tomes, Proc. Zool. Soc. London, 1860, p. 215. (Ecuador.)

The *Hesperomys minutus* of Tomes was based upon an immature specimen obtained by Fraser, but without definite locality, although it was supposed to be from Pallatanga. Oldfield Thomas, in describing a new species of this genus from Peru (*Ann. and Mag. Nat. Hist.*, 1894 (XIV), p. 357), identified with Tomes' type an adult specimen in the British Museum which was also collected by Fraser at Pallatanga, December, 1858. Later (*op. cit.*, 1898 (II), p. 267) he described this specimen as new under the name *Oryzomys dryas*. His explanation of this action is that specimens received from Mr. Söderström (locality not given) were obviously identical with Tomes' type and different from the Pallatanga skin.

Mr. Rhoads' five specimens were all obtained in the vicinity of Hacienda Garzon (or Rosario) at the southern foot of Mt. Pichincha, some of them "in meadows and swamps below the house, 10,150 feet," others higher up near the paramo, 12,000 feet.

	Length.	Tail.	Hind foot.	Ear.
♂, May 12, 1911.....	180	100	23	11.5
♂, May 12, 1911.....	183	103	23	12
♂, May 13, 1911.....	178	98	23	13
♂, May 15, 1911.....	180	100	23	13
♀, May 12, 1911.....	190	103	22	12

The Söderström specimens mentioned by Thomas doubtless came from Pichincha, which is of easy access from Quito, and probably

Tomes' type was also obtained there. While the latter is probably not absolutely identifiable after this lapse of time, it seems best to retain his name *minutus* for this form. The animal is a little smaller than *Mus musculus* and almost exactly the same color below, while above it is very much more rusty with a clearer line of demarcation on the side. The ground color above, at the base of the tail where it is purest and brightest, is "tawny ochraceous" of Ridgway's Color Standards 1912, but is duller and browner on the back and head and thickly mixed everywhere with black hairs.

6. *Reithrodontomys söderströmi* Thomas.

Reithrodontomys Söderströmi Thomas, Ann. and Mag. Nat. Hist., 1898 (I), p. 451. (Quito.)

Four specimens obtained from Mr. Söderström, who collected them at or near Quito, and one obtained in Quito by Mr. Rhoads, April 25, ad. ♀, length 185 mm., tail 105, hind foot 20, ear 14.5.

7. *Phyllotis haggardi* Thomas.

Phyllotis Haggardi Thomas, Ann. and Mag. Nat. Hist., 1898 (II), p. 270. (Mt. Pichincha.)

One immature female (12,697, Coll. A. N. S. Phila.) obtained at Hacienda Garzon at the southern foot of Pichincha, at 12,000 feet, nearly up to the paramo, May 12, 1911.

It agrees very well with Thomas' description, excepting that the tail is only 50 mm. in length, whereas that of the type measured 86 mm.

8. *Epeomys vulcani* (Thomas).

Epeomys vulcani Thomas, Ann. and Mag. Nat. Hist., 1898 (I), p. 452. (Mt. Pichincha, 12,000 feet.)

A partially mummified skin (12,698, Coll. A. N. S. Phila.) obtained from Mr. Söderström, collected on the west side of Mt. Pichincha. Thomas seems to have made a mistake in citing the tail as "barely as long as the head without the body," since a few lines below he gives length of "head and body 111 mm. and tail 84 mm." The measurements are probably correct as given, since our dried specimen is 100 mm. long exclusive of the tail which measures about 72 mm.

9. *Thomasomys paramorum* Thomas.

Thomasomys paramorum Thomas, Ann. and Mag. Nat. Hist., 1898 (I), p. 453. (Paramo, south of Chimborazo.)

Ten specimens obtained on the paramo of Mt. Pichincha are apparently referable to this species, obtained originally in a similar region near Mt. Chimborazo.

They are almost exactly like the much smaller *Oryzomys minutus* in color, both above and below.

Mr. Rhoads' measurements are as follows:

	Length.	Tail.	Hind foot.	Ear.
♀, Hacienda Garzon, 10,500 ft., May 4.....	201	108	23	14
♀, juv., Hacienda Garzon, 10,500 ft., May 13.....	174	95	23	14
♀, Hacienda Garzon, 10,500 ft., May 15.....	215	118	24	12
♂, Hacienda Garzon, 10,500 ft., May 15.....	216	118	24	16
♂, Paramo, 13,000 ft., May 7.	205	100	24	15.5
♀, Paramo, 13,000 ft., May 7.	205	125	25	16
♀, Paramo, 13,000 ft., May 7.	204	112	24	14
♀, Paramo, 13,000 ft., May 7.	195	102	24	14
♂, Paramo, 13,000 ft., May 7.	210	115	25	15

10. *Thomasomys rhoadsi* sp. nov.

Mr. Rhoads secured a series of seven specimens of another *Thomasomys* on the paramo of Mt. Pichincha apparently allied to *T. cinereus* Thomas, from Cutervo, Peru. As no such animal seems to have been described from Ecuador, I propose to name it *Thomasomys rhoadsi*, in honor of Mr. Samuel N. Rhoads whose expedition to Ecuador has brought to light so many interesting species of vertebrates.

Type No. 12,709, Collection Academy of Natural Sciences of Philadelphia, ♂. May 15, 1911, Hacienda Garzon, Mt. Pichincha, 10,500 feet. Coll. by Samuel N. Rhoads.

Skull similar to that of *T. cinereus* Thomas, but a little larger with much wider interpterygoid fossa. Fur long and soft. Brown tints of upper parts nearly bistre of Ridgway's "Color Standards," but so mingled with black hairs that the general appearance is very much darker, nearly black on the back. The fur of the under parts is gray with buffy tips, not whitish. The upper side of the hind feet is clothed with dusky hairs down to the base of the toes, while the latter have scattered white hairs, notably at their extremities. The fore feet are but scantily haired, while the hairs on the tail in no way conceal the scales. The ears are well haired.

Length 250 mm., tail 110, hind foot 31.5, ear 16. Skull measurements.² Total length 35 mm., greatest breadth 18, molar series 7, incisors to first molar 10, breadth of constriction between orbits 6, lower jaw (bone only) 20.

² As used by Thomas in description of *T. cinereus*.

The series of skins measures as follows:

	Length.	Tail.	Hind foot.	Ear.
♂, Hacienda Garzon, 10,500 ft., April 28.....	250	115	32	17
♀, Hacienda Garzon, 10,500 ft., April 28.....	212	103	29	16
♀, juv., Hacienda Garzon, 10,500 ft., April 28.....	210	100	28.5	15.5
♂, Hacienda Garzon, 10,500 ft., April 28.....	253	115	30.5	15.5
♂, Hacienda Garzon, 10,500 ft., May 12.....	30	15
♀, Hacienda Garzon, 10,500 ft., May 15.....	250	110	31.5	16

Mr. Osgood informs me that so far as he is aware all of the described species approximating this in size have relatively shorter tails, while the blackish back distinguishes it from all those species available for comparison.

"Several specimens of this mouse were secured above the Casa Garzon, along the trail from that Hacienda to the summit of Mount Pichincha. The elevation was a few hundred feet above the valley, where the marsupial *Cænolestes* was secured, approximately 10,500 feet and probably this is their lowest range, as much trapping was done 200 to 300 feet farther down without securing any. Their habitat was on the rocky wooded slopes, where they had burrows similar to those of our North American Microtine rodents, from one to three inches below the surface of the soil and débris.

"I was interested to notice, when skinning these mice, that all of them, or possibly only the males, were supplied with a remarkable prolongation of the anus, that organ being extended, or rather, extensible, beyond the thighs for half an inch or more, as indicated in the memoranda on the labels of the specimens. This prolongation was not an internal extension, but external, being hairy throughout." (S. N. Rhoads.)

11. *Akodon mollis altorum* Thomas.

Akodon mollis altorum Thomas Ann. and Mag. Nat. Hist., 1913 (II), p. 404. (Cañar.)

Nine specimens of this mouse were obtained on the paramo of Pichincha or near Hacienda Garzon, a little lower down.

Externally they are almost exactly like *Thomasomys paramorum*, averaging perhaps a little darker or duller, but are easily recognized by the shorter tail.

The measurements of the series are as follows:

	Length.	Tail.	Hind foot.	Ear.
♂, Hacienda Garzon, 10,500 ft., April 28.....	185	73	24.5	14
♀, Paramo, 13,000 ft., May 7.	105	26	14
♂, Paramo, 13,000 ft., May 7.	169	69	23	14
♀, Paramo, 13,000 ft., May 7.	160	64	23	12
♀, juv., Paramo, 13,500 ft., May 8.....	155	60	23	10
♂, Paramo, 13,500 ft., May 8.	187	80	23.5	11
♀, Hacienda Garzon, 10,500 ft., May 12.....	172	72	23	13.5
♀, Hacienda Garzon, 10,500 ft., May 16.....	172	68	23	15
♀, Cumboya, N. S. of Quito, May 29.....	152	60	23	13.5

12. *Sciurus irroratus* (Gray).?

Macroxus irroratus Gray, Ann. and Mag. Nat. Hist., 1867, XX, p. 431.
(Upper Ucayali River, Brazil.)

One specimen (12,725, Coll. A. N. S. Phila.), male, procured in the Pagma forest, July 11, 1911, is perhaps referable to this species, though no suitable material is available for comparison.

Length 330, tail 152, hind foot 50, ear 20.

"Squirrels were reported by the natives to be in the forests about Huigra from 4,000 feet and upwards, but we saw none until we penetrated the Pagma forest above Hacienda Jalancay, 6,000 to 7,000 feet. They were exceedingly rare, however, even in this forest. I saw one, after the specimen secured was taken, in an orange grove near the Casa, 1,500 feet lower down. I can state nothing about their habits, not having personally observed them in life. No other species of squirrels were observed in our wanderings." (S. N. Rhoads.)

13. *Sciurus hoffmanni söderströmi* subsp. nov.

One specimen (No. 12,726, Collection Academy of Natural Sciences of Philadelphia), from Mt. Pichincha, November, 1903, collected by L. Söderström.

While a member of the *S. hoffmanni* group, this specimen is much more rusty-red especially across the shoulders and on the fore legs than any specimens I have seen from Costa Rica or any in a considerable series with which Mr. Osgood has compared it in the Field Museum. In other respects it does not seem to differ.

I find no name applicable to this form and would propose that it be called *Sciurus hoffmanni söderströmi*, in honor of its collector,

who has done so much in developing our knowledge of the birds and mammals of Ecuador.

14. *Sylvilagus andinus* (Thomas).

Lepus andinus Thomas, Ann. Nat. Hist., XX, 1897, p. 551. (Mt. Cayambi.)

Three specimens obtained on the mountains above Chambo, 10,000–10,400 ft.

	Length.	Tail.	Hind foot.	Ear.
♀, April 10.....	330	17	73	57
♂, April 10.....	340	17	72	59
♂, juv., April 17.....	280	15	60	55

These specimens no doubt represent *S. a. chimbanus* Cabrera (*Trans. Mus. Cien. Nat. Madrid, Zool. Series*, No. 9, 1913), but as I am unable to appreciate the difference between the two forms and have no typical material of either for comparison, I prefer to refer the specimens to Thomas's *S. andinus*.

"These cottontails were found, as we rose from the Chimbo River valley up the slopes, 500 to 1,000 feet above the town of Chambo. They frequented the brush-grown pastures in similar situations to those frequented by our cottontails of the United States, only they kept more closely to the bushes and were not found in the open pastures. They seemed to range from that point no lower, but to reach up the slopes into the paramo, at an elevation of 12,000 to 13,000 feet, but we secured none in the paramo region, abundant as they evidently were by their tracks and droppings in the thick tussock grass. We also saw several on the paramo of Mount Pichincha, above Hacienda Garzon, but were fated to secure no specimens. None were seen in this locality below the paramo, viz., 11,000 feet, approximately. It is quite possible that the paramo rabbit is distinct from the animal of the templada, at least subspecifically, or that there are two species, not distinguishable at a distance by a field observer." (S. N. Rhoads.)

15. *Mazama americana* (Erxl).

Moschus americanus Erxleben, Syst. Regni. Anine, vol. I, p. 1777.

One female specimen (12,730, Coll. A. N. S. Phila.) obtained at the junction of the Chanchan and Chaguancay Rivers on the lower western slope of the Andes, February 27, 1911.

Length 1,050 mm., height at shoulder 600, height at rump 715, tail 160, ear 115.

Mr. W. H. Osgood has revived Erxleben's name for *M. nemo-rivagus* (*Field Museum, Nat. Hist. Publ.*, No. 155, vol. X, p. 43, 1912)

but Oldfield Thomas (*Ann. and Mag. Nat. Hist.*, XI, 1913, p. 585) considers that it applies rather to *M. rufus* of authors, and I so use it.

16. *Mustela aureoventris* Gray.

Mustela aureoventris Gray, Proc. Zool. Soc. London, 1864, p. 55. (Ecuador.)

One specimen (12,731, Coll. A. N. S. Phila.), male, procured in the Pagma forest, July 11.

Measurements: Length 420 mm., tail 165, hind foot 48, ear 12.

While there is an earlier *Mustela auriventer* Hodgs, 1841, which in my opinion would invalidate Gray's name, yet it does not seem desirable to propose a substitute until the relationship of the Ecuador species to those described from Colombia and Peru is definitely settled. At present I am unable to secure any of the material necessary for comparison.

"The only weasel seen on the expedition was shot by Mr. Lemmon, my assistant, in the Pagma forest from a tree at a low elevation, and, until picked up, was thought to be a squirrel." (S. N. Rhoads.)

17. *Blarina osgoodi* sp. nov.

Eight specimens of a *Blarina* were obtained at Hacienda Garzon on Mt. Pichincha at an altitude of 10,500 ft. and on the paramo 1,500 ft. higher. Four of these were prepared as skins and the others preserved in spirits.

So far as I am aware, no *Blarina* has previously been found south of Colombia (*B. thomasi* Merriam and *B. squamipes* Allen) and Merida, Venezuela (*M. meridensis* Thomas); and as the Ecuador specimens differ from all of these, I propose to name them *Blarina osgoodi* for Mr. W. H. Osgood, of the Field Museum of Natural History, whose expeditions to South America have done so much to enrich our knowledge of its mammals and birds.

Type from Hacienda Garzon, Mt. Pichincha, 10,500 ft. altitude, May 12, 1911, female, collected by Samuel N. Rhoads. No. 12,732, Collection A. N. S. Phila.

Similar in size and coloration to *B. thomasi* Merriam from Bogota, but not quite so brown.

Anterior unicuspid teeth less distinctly angulate on the inner side than in *B. thomasi* and the third and fourth unicuspid teeth quite different. The third unicuspid in *B. thomasi* is apparently as long as broad, while in *B. osgoodi* it is very much broader than long, and both it and the fourth unicuspid are smaller in every way.

Total length 105 mm., tail 30 mm., hind foot 14 mm.

Skull measurements: total length 22 mm., greatest breadth 10 mm.

Measurements of the other skins:

	Length.	Tail.	Hind foot.
♀, Hacienda Garzon, 10,500 ft., May 5.....	113	30	14
♀, Paramo, 13,000 ft., May 7.....	105	26	14
♂, Paramo, 13,000 ft., May 7.....	106	26	14

I am not prepared to say how good a character the squamation of the feet may prove to be, but *B. osgoodi* exhibits scaly plates on the hind feet similar to, but smaller than, those of *B. squamipes*. They are not apparent on the fore feet nor on any of the feet of *B. thomasi* which has the feet much more thickly haired than either *B. osgoodi* or *B. squamipes*.

In general size, color, and length of tail *B. meridensis* and *B. squamipes* appear to be very similar, and it would be interesting to know whether the former exhibits the marked squamation.

"These shrews were first taken at the Hacienda Garzon on the southern slope of Mount Pichincha, about on the level with the Casa. They were trapped in runways along the banks of a deeply cut artificial ditch, the kind used in that country in lieu of a fence against cattle. The location was wooded clearing and brush land, at that point deeply shaded upland. The runways in location and character were precisely like those made and used by Blarinas in the United States." (S. N. Rhoads.)

18. *Didelphis marsupialis* Linn.

Didelphis marsupialis Linnaeus, Syst. Nat., ed. X., 1758, p. 54.

One specimen obtained at Quito collected on the east side of Cayambe. Also a ramus of a lower jaw found at Bucay, June 20.

Mr. Osgood has compared the Cayambe specimen with true *marsupialis* of Guiana and Venezuela and finds but little difference except that it is somewhat larger. It may possibly be referable to *D. m. colombica* Allen, type locality Santa Marta.

19. *Cænolestes fuliginosus* (Tomes).

Hyracodon fuliginosus Tomes, Proc. Zool. Soc. London, 1863, p. 51. (Ecuador.)

Two female specimens of this little known marsupial were obtained by Mr. Rhoads at Hacienda Garzon, near the paramo of Mt. Pichincha, May 12, 1911, about three months after Mr. Osgood had rediscovered the very closely allied *C. obscurus* on the Paramo de Tama on the borderland of Colombia and Venezuela.

So far as I am aware, no specimen of this interesting animal has been obtained in Ecuador since the type was taken by Fraser about

1859 (see Tomes, *P. Z. S.*, 1860, p. 213). Fraser's specimen was supposed to have come from Pallatanga, but this was not certain as the collection had been mixed up, and it is quite as likely, in view of Mr. Rhoads' discovery, that he got it on Mt. Pichincha.

As given by Tomes in describing the animal in 1863, the measurements of the type (reduced to millimeters) are: head and body 97 mm., tail 97, head 31.

In his description of *C. obscurus* Thomas gives the measurements as head and body 151, tail 144, hind foot 23, ear 12 x 11.5, and bases the species as distinct from *C. fuliginosus* on the fact that it is "double the size."

Mr. Rhoads' measurements of his two specimens are:

	Length.	Tail.	Hind foot.	Ear.
♀, Hacienda Garzon, 10,500 ft., May 12.....	198	103	22	11
♀, Hacienda Garzon, 10,500 ft., May 12.....	217	110	22.5	11.5

Mr. Osgood's series of five females of *C. obscurus* averaged as follows:

Total length 223 mm., head and body 107.6, tail vertebræ 115.4, hind foot 22.5.

It will be readily seen, therefore, that his specimens and those of Mr. Rhoads are practically identical in measurements, while a comparison of the skins made by Mr. Osgood shows "no appreciable difference." Unless it is maintained that there are two species in Ecuador, it looks very much as if *C. obscurus* Thomas might become a synonym of *C. fuliginosus* Tomes. Such a view, involving the assumption that Tomes' measurements were quite erroneous or that his specimen was a young one, seems to me much more rational than to suppose that two species of quite different size occur in Ecuador.

"The two specimens were secured in swampy ground, the edge of a large pasture on the Hacienda Garzon, within a few feet of a swiftly flowing stream of considerable size. They were caught in small cyclone mouse traps set in underground runways among the thick grass, these runways being about on the level with the waterline of the swamp. They were caught on the same day, soon after placing the traps in that locality, but although I continued to trap there for a week longer, having as many as 40 or 50 traps in that place, I secured no more specimens there, nor in any other similar localities where trapping was done. The stream alluded to runs over a bed strewn with volcanic rocks and boulders and is in

an open cultivated valley-head, draining the south slopes of Mount Pichincha, about 8 miles south of Quito and at an elevation of about 10,500 feet, the valley at this point being about half a mile wide and extending to even greater widths as far as one can see, in a southerly direction." (S. N. Rhoads.)